



Background Reference: Azerbaijan

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Overview

Azerbaijan has a mature oil and gas sector and has produced hydrocarbons for almost 150 years. The country is one of the Caspian Sea region's main export routes to the West.

Azerbaijan, one of the oldest oil-producing countries in the world, is an important oil and natural gas supplier in the [Caspian Sea region](#), particularly for European markets. Although traditionally it has been a prolific oil producer, Azerbaijan's importance as a natural gas supplier is increasing because of field development and new export infrastructure. Overall, Azerbaijan is a net energy exporter.

Figure 1. Map of Azerbaijan



Source: CIA World Factbook

Petroleum and other liquids

Azerbaijan has played a historically important role as an oil producer. Most of its hydrocarbons production comes from offshore fields in the Caspian Sea.

Azerbaijan has played a significant role in the development of today's global oil industry. The world's first paraffin factory opened in Azerbaijan in 1823, and the first oil field was drilled in the country in 1846. Azerbaijan was also the site of the first offshore oil field and platform in the world—the Neft Dashlary—which was completed in 1951 in the shallow water of the Caspian Sea. The oil field still produces today.

The country's largest hydrocarbon basins are located offshore in the Caspian Sea, particularly the Azeri-Chirag-Gunashli (ACG) fields.¹

Sector organization

The State Oil Company of the Azerbaijan Republic is involved in all segments of the oil sector. SOCAR produces about 20% of Azerbaijan's total oil output, and international oil companies produce the remainder.²

The Ministry of Energy formulates state energy policy and regulates the national oil company—the State Oil Company of the Azerbaijan Republic (SOCAR). In addition, the Ministry works to attract foreign investment and conducts negotiations on pipelines and production-sharing agreements.

SOCAR is involved in exploring and producing oil and natural gas in Azerbaijan. SOCAR also operates the country's Heydar Aliyev Baku Oil Refinery, the country's pipeline system, and the country's oil and natural gas imports and exports. Much of Azerbaijan's oil is marketed by the SOCAR's Geneva-based subsidiary—SOCAR Trading—which has been operating since 2008.

Exploration and production

The Azeri-Chirag-Gunashli fields account for about three-quarters of Azerbaijan's petroleum and other liquids production.

Petroleum and other liquids production in Azerbaijan peaked at slightly more than 1 million b/d in 2010. Since then, production has generally declined.

Azerbaijan's main producing field is the Azeri-Chirag-Gunashli (ACG) complex. The ACG fields are operated by BP, the largest shareholder in the Azerbaijan International Operating Company (AIOC) that was formed to develop the fields. Other companies with an interest in the ACG fields include Chevron, Inpex, Statoil, Turkiye Petrolleri, ExxonMobil, SOCAR, ITOCHU, and ONGC Videsh.³ The stakeholders have extended their ACG production-sharing agreement (PSA) with the Azerbaijani government through 2049.⁴

Field developers originally expected peak petroleum production from ACG to reach 1 million b/d, but ACG production peaked in 2010 at 823,100 b/d before falling to 664,400 b/d in 2012 (Figure 4).⁵ Since 2012, production has continued to modestly decline.

ACG has been developed in phases; the newest platform—West Chirag—is part of the Chirag Oil Project and began producing oil in January 2014. The platform has a capacity of 183,000 b/d.⁶

BP is the largest foreign investor in Azerbaijan, participating not only in the development of the ACG fields, but also in the development of the Shah Deniz natural gas and condensate field. The Shah Deniz field produces a small but stable volume of about 50,000 b/d of condensate.⁷ At peak production of the next development stage of the Shah Deniz field, condensate production capacity from the field could more than triple.⁸ SOCAR also produces some condensate from the shallow-water Gunashli field; the deepwater portion of the Gunashli field is part of the ACG development that BP operates.

Most of the oil produced in Azerbaijan, including oil from the ACG fields, is medium-light, sweet crude. Most of Azerbaijan’s oil is exported through the Baku-Tbilisi-Ceyhan (BTC, Figure 2) pipeline and is marketed as BTC blend (36.6° API gravity, 0.15% sulfur).⁹ The smaller Baku-Supsa pipeline carries a similar grade of oil that is marketed as Azeri light (35.2° API gravity, 0.14% sulfur).¹⁰ Small volumes of lower-quality oil are exported through the northern export pipeline to Russia. This oil is blended in Russia and marketed as Urals blend. The quality of Urals blend can vary, but the oil is generally a medium, sour crude.

Figure 2. Major Caspian oil and natural gas routes



Source: U.S. Energy Information Administration based on IHS Markit Midstream Database (IHSM EDIN)

Exports

The Baku-Tbilisi-Ceyhan pipeline is the main route for transporting Azerbaijan's oil to world markets.

Azerbaijan's crude oil exports peaked in 2010, when they averaged slightly more than 900,000 b/d. Exports have fallen since then because production has declined.

Azerbaijan has three crude oil export pipelines (Table 1).¹¹ The country also exports small amounts of oil by rail. Most of its oil is exported through the BTC pipeline. The construction of the BTC pipeline transformed the country's oil industry, because it allowed for exports of lighter and sweeter crude oil than Russia's Urals blend and provided transportation capacity out of the Caspian that did not rely on transiting the [congested Turkish straits](#) or crossing Russian territory.

Table 1. Azerbaijan's oil export pipelines

Facility	Status	Capacity (thousand barrels per day)	Total length (miles)	Origin	Destination	Details
Baku-Tbilisi-Ceyhan (BTC)	Operating	1,200	1,100	Sangachal terminal, near Baku, Azerbaijan	Ceyhan terminal, on Turkey's Mediterranean coast	First tanker loaded at Ceyhan in June 2006
Baku-Novorossiysk (Northern Route Export Pipeline)	Operating	105	825	Sangachal terminal, near Baku, Azerbaijan	Novorossiysk, on Russia's Black Sea coast	Started operation in 1996
Baku-Supsa (Western Route Export Pipeline)	Operating	100	515	Sangachal terminal, near Baku, Azerbaijan	Supsa, on Georgia's Black Sea coast	First tanker loaded at Supsa in April 1999

Sources: U.S. Energy Information Administration based on BP and SOCAR

Most of the oil transported through the BTC pipeline is from Azerbaijan's ACG fields, but BTC blend also includes condensate from the Shah Deniz field as well as crude oil or condensate from fields in [Turkmenistan](#), [Kazakhstan](#), and Russia. The BTC pipeline originates at Azerbaijan's Sangachal terminal, which can receive oil by tanker from any of Azerbaijan's Caspian neighbors.

In July 2010, near the peak of ACG production and Azerbaijani exports, the BTC pipeline transported slightly more than 1 million b/d of oil. Since then, the pipeline has run with significant spare capacity, on average exporting less than its capacity of 1.2 million b/d.¹² SOCAR has proposed reversing part of the Northern Route pipeline—from Baku, Azerbaijan, to Makhachkala, Russia—to bring more Russian oil to Baku for transport through the BTC pipeline to Ceyhan. This change would allow the Russian oil to bypass the crowded Turkish straits.

Azerbaijan is primarily a crude oil and condensate exporter, although the country also exports small volumes of refined petroleum products, mainly diesel.

Refining sector

Azerbaijan has a crude oil refining capacity of 120,000 b/d, according to the OGJ.¹³ Modernization of the SOCAR-owned and operated Heydar Aliyev Baku refinery by 2021 will expand the facility's capacity from 120,000 b/d to 150,000 b/d.¹⁴ This project will also allow SOCAR to operate the refinery for at least another 15 years. The Oil and Gas Processing and Petrochemical Complex (OGPC)—another part of SOCAR's expansion plan—will include the construction of a new refinery, natural gas processing, and a petrochemicals plant to replace much of the country's aging facilities. The OGPC will be built in phases, and the new refinery is scheduled to come online after 2030 with a capacity of about 170,000 b/d.¹⁵

Natural gas

Azerbaijan's Shah Deniz natural gas and condensate field in the Caspian Sea is one of the largest in the world, presenting a significant opportunity to supply Europe's Southern Gas Corridor.

Most of Azerbaijan's reserves are associated with the Shah Deniz field, which forms the beginning of the Southern Gas Corridor (SGC). The SGC will bring natural gas from the Caspian to southern Europe via the Baku-Tbilisi-Erzurum (BTE) and to the Trans-Anatolian and Trans Adriatic pipelines. The SGC has significantly increased Azerbaijan's importance as a natural gas producer and exporter.

Natural gas plays a central role domestically, accounting for about two-thirds of total energy consumption. About half of the country's natural gas consumption is used for power generation.

Sector organization

SOCAR and its wholly-owned subsidiaries are responsible for natural gas processing, transport, distribution, and storage in the domestic market. Prices for these services are regulated by the Tariff Council of Azerbaijan Republic. SOCAR is also responsible for the domestic transportation of natural gas exported to Iran, Georgia, and Russia.

Exploration and production

The Shah Deniz field, discovered in 1999, is one of the world's largest natural gas and condensate fields.

Most of Azerbaijan's natural gas is produced offshore in either the Shah Deniz field or the ACG complex. The Shah Deniz natural gas and condensate field was developed in two phases, beginning with the first phase that started production in late 2006. The second phase (Shah Deniz 2), which began to come online in 2018, is expected to produce 565 Bcf of natural gas per year. BP operates the field and is the largest shareholder with 28.8% of the joint venture that is developing the field. Other joint venture participants include SOCAR (16.7%), Turkish Petroleum Corporation (TPAO) (19%), Petronas (15.5%), Lukoil (10%), and Naftiran Intertrade Company (NICO, 10%).¹⁶

The ACG fields provide associated natural gas to the Azerigaz system for domestic use through an undersea natural gas pipeline to the Sangachal terminal at Baku. The Sangachal Terminal, located south of Baku, is one of the world's largest integrated oil and natural gas processing terminals, and it will expand to incorporate the additional 565 Bcf per year from Shah Deniz 2. The terminal receives, stores, and processes crude oil and natural gas from the ACG fields and from Shah Deniz.

Natural gas exports

Azerbaijan has been a net exporter of natural gas since 2007. Most of Azerbaijan's natural gas exports are shipped through [Georgia](#) to [Turkey](#) through the South Caucasus Pipeline (SCP), also called the Baku-Tbilisi-Erzurum (BTE) pipeline. The BTE runs parallel to the BTC oil pipeline for much of its route (Table 2).¹⁷ Following the construction of additional pipeline infrastructure associated with the Southern Gas Corridor (SGC), Azerbaijan may be able to export Shah Deniz gas directly to other European markets by 2020.

Most of Azerbaijan's natural gas exports via the SCP are destined for Turkey, but small volumes also go to Greece through the Turkey-Greece interconnector. Under a previous arrangement, Turkey re-exported Azerbaijani natural gas to Greece, but a new agreement allows Azerbaijan to directly export volumes to the European Union. Of Shah Deniz 2's anticipated 565 Bcf, Turkey is contracted to take 212 Bcf, and [Italy](#) is contracted to take 283 Bcf. Bulgaria and Albania are each contracted to take 35 Bcf. Deliveries to Turkey began in mid-2018, and deliveries to southeastern Europe are scheduled to start by 2020.¹⁸

From 2007 to 2014, Azerbaijan also exported small volumes of natural gas to Russia through the Hajiqabul-Mozdok pipeline. In addition, small volumes of natural gas are shipped to Iran through the Hajiqabul-Astara pipeline. In exchange, Iran ships natural gas to Nakhchivan, Azerbaijan's exclave situated between Iran and Turkey. The exclave is wholly dependent on natural gas supplied by Iran.

Azerbaijan has two underground natural gas storage fields with total working gas storage capacity of almost 180 Bcf,¹⁹ which is more than enough capacity to handle the country's own seasonal swings in consumption. Azerbaijan resumed importing natural gas from Russia following a renewed agreement in late 2017; it had previously proposed importing natural from Russia or Iran in the spring and summer, generally the low-demand periods in the region. Azerbaijan plans to use the natural gas to fill storage and to increase enhanced oil recovery operations. Azerbaijan could also return some of the natural gas to Iran in the winter, when northern Iran often needs natural gas to cover peak demand periods.

Figure 3. Key oil and natural gas infrastructure in Azerbaijan



Table 2. Azerbaijan's natural gas export pipelines

Facility	Status	Capacity (billion cubic feet per year)	Total length (miles)	Origin	Destination	Details
South Caucasus Pipeline (SCP)	Operating	310	430	Shah Deniz field, Azerbaijan	Georgia and Turkey	First deliveries to Turkey in 2007, follows the route of the BTC oil pipeline from Azerbaijan through Georgia, and connects to Turkey's domestic transmission pipeline system
South Caucasus Pipeline (expansion)	Under construction	565	430	Shah Deniz field (Stage 2), Azerbaijan	Georgia, Turkey, and southeast Europe	First deliveries to Turkey in 2018, deliveries to southeast Europe expected by 2020; connects to the Trans-Anatolian Pipeline (TANAP), which crosses Turkey, and to the Trans Adriatic Pipeline (TAP), which is slated to run from the Turkish border to southeast Europe and Italy; TANAP was inaugurated in June 2018, and TAP is under construction
Hajiqabul (Gazi-Magomed)-Mozdok Pipeline	Operating	Bidirectional	460			Originally completed in 1983; in 2000, the town of Gazi-Magomed, Azerbaijan, was renamed Hajiqabul
		460 (originally)		Russia	Azerbaijan	From 1983 to 2007, used to import Russian natural gas to Azerbaijan for domestic consumption
		175		Azerbaijan	Russia	From 2007 to 2014, used to export small volumes of natural gas to Russia
Hajiqabul (Gazi-Magomed)-Astara Pipeline	Operating	Bidirectional	170			Originally completed in 1972
		350 (originally)		Iran	Azerbaijan	Originally designed to carry Iranian natural gas to Azerbaijan and the Soviet Union; imports from Iran ended in 1979 with the Iranian revolution
		30–65		Azerbaijan	Iran	In 2006, Azerbaijan began supplying natural gas to Iran in exchange for Iran supplying gas to the Azerbaijan exclave of Nakhchivan
Iran-Nakhchivan Pipeline (Salmas-Nakhchivan)	Operating	15–65	65	Iran	Nakhchivan exclave, Azerbaijan	

Sources: U. S. Energy Information Administration, based on BP, IHS EDIN, Platt's *International Gas Report*, and *Cedigaz News Report*

Electricity

Natural gas-fired generation accounts for most electric power produced in Azerbaijan. Hydropower accounts for some of the remainder.

Most of Azerbaijan’s electric power comes from natural gas-fired generation.²⁰ Oil use in the electric sector has been reduced since 2008, because equipment has been refurbished or replaced.

Hydropower is also a small source of power generation, and the government of Azerbaijan encourages investment in generation from renewable energy sources in the country, including small-scale wind and solar facilities. Of the small amount of waste, wind, and solar electricity generation, most generation comes from a power plant in Baku that opened in 2012 and burns municipal waste.

Sector organization

Azerenerji—Azerbaijan's state power utility— is responsible for the generation, dispatch, and transmission of electric power. Azerenerji, along with the Nakhchivan Energy Authority, operates most of the country’s power stations.²¹ A much smaller amount of generation capacity is operated by the State Agency for Alternative and Renewable Sources and by independent power producers.

Azerbaijan's power sector has no competition among its power producers. Electricity prices are regulated, and power producers are required to supply their power to the central dispatch system for transmission and distribution.

Notes

- In response to stakeholder feedback, the U.S. Energy Information Administration has revised the format of the *Country Analysis Briefs*. As of December 2018, updated briefs are available in two complementary formats: the Country Analysis Executive Summary provides an overview of recent developments in a country's energy sector and the Background Reference provides historical context. Archived versions will remain available in the original format.
- Data presented in the text are the most recent available as of December 2018.
- Data are EIA estimates unless otherwise noted.

Endnotes

¹ BP, [Azeri-Chirag-Deepwater Gunashli](#), (accessed September 10, 2018); and BP, [2017 year-end results](#) (accessed September 10, 2018).

² SOCAR, [Economics and Statistics](#), (accessed September 10, 2018)

³ BP, [Azeri-Chirag-Deepwater Gunashli](#), (accessed September 10, 2018).

⁴ BP, “[The Azerbaijan government and co-venturers sign amended and restated Azeri-Chirag-Deepwater Gunashli PSA](#),”(September 14, 2017)

⁵ BP, “Year end results,” [2009, 2010, 2011, 2013, 2014, 2015, 2016, and 2017](#); and “[BP in Azerbaijan Sustainability Report 2016](#),” (accessed September 10, 2018), p. 8.

⁶ BP, [Azeri-Chirag-Deepwater Gunashli](#), (accessed September 10, 2018).

⁷ BP, [Shah Deniz](#), (accessed September 10, 2018).

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- ⁸ Southern Gas Corridor, [Shah Deniz project](#) (accessed September 10 2018)
- ⁹ BP, [Azeri \(BTC\)](#), (accessed September 10, 2018).
- ¹⁰ BP, [Azeri light \(Supsa\)](#), (accessed September 10, 2018).
- ¹¹ SOCAR, [Baku-Novorossiysk oil pipeline](#), (accessed September 10, 2018); BP, [Baku-Tbilisi-Ceyhan pipeline](#), (accessed September 10, 2018); and BP, [Western Route Export Pipeline](#), (accessed September 10, 2018).
- ¹² BP, [2017 year-end results](#), (accessed September 10, 2018).
- ¹³ *Oil & Gas Journal*, "Worldwide Refineries—Capacities as of January 1, 2018," (December 4, 2017), p. 1
- ¹⁴ KBR Press release, [KBR Joint Venture Awarded Important Project Management Contract for Baku Oil Refinery Modernization](#), (March 8, 2016).
- ¹⁵ SOCAR, "[Fluor selected as SOCAR's project management contractor](#)," (March 30, 2015).
- ¹⁶ BP, [Shah Deniz](#), (accessed September 10, 2018).
- ¹⁷ BP, [South Caucasus pipeline](#), (accessed September 10, 2018); IHS EDIN; Rodova, Nadia, "Central Asia fills Gazprom's short-term needs," *Platt's International Gas Report*, issue 640, (January 18, 2010), p. 6; and Cedigaz News Report, "AZERBAIJAN: SOCAR modernizes infrastructure to increase gas supplies to Iran," vol. 49, no. 2 (January 25, 2010), p. 9.
- ¹⁸ BP, [Shah Deniz Stage 2](#), (accessed September 10, 2018).
- ¹⁹ Cedigaz, [Underground Gas Storage in the World – 2017 Status](#), p. 7 (accessed September 10, 2018).
- ²⁰ International Energy Agency (IEA), *World Energy Balances 2017* edition.
- ²¹ Azerenerji, [Energy production](#), (accessed September 10, 2018)